Literacy and Education in Ireland*

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Abstract: Recent media attention has focused on the low ranking of Ireland in a major international study on literacy. In this paper we examine the dataset used in these studies to consider the reason behind the low ranking. We find significant evidence that the underlying reason for this is the low level of formal schooling of older individuals, possibly due to the lack of free secondary schooling. Moreover we find that formal schooling in Ireland has a bigger effect on literacy outcomes than in either Northern Ireland or Great Britain.

I INTRODUCTION

Recently media attention has focused on the apparent low level of literacy in Ireland compared to many other industrialised nations. Most recently the World Development Report reported that 23 per cent of the adult population are functionally illiterate[1] leading to criticisms of the Irish educational system for failing to equip individuals with a basic level of literacy.

1. Those at Level 1 on the prose scale of the IALS survey were defined as functionally illiterate.

In this paper we show that the principal reason behind the relatively low level of literacy in the Republic of Ireland (RoI) is the presence of a cohort effect — a consequence of the older age group receiving less schooling than the younger age group due to differences in educational policy thus lowering the average literacy level of the whole sample. We also show that the RoI's educational system is in fact more effective than that of the education system of Northern Ireland (NI) and Great Britain (GB) in converting schooling into literacy.

Section II describes the International Adult Literacy Survey (IALS). The interpretation behind the literacy scores is outlined in Section III. Cohort analysis and the relationship between education and literacy are described in Sections IV and V. We conclude in Section VI.

II DATA

The data used in this paper, as in the publicised OECD and World Development Report, is the International Adult Literacy Survey (IALS) which was administered by 13 governments in association with the European Union, the OECD and UNESCO between 1994 and 1996.[2] The purpose of the survey was to assess the literacy level of the adult population and to provide a common measure that would allow comparison of literacy proficiency across countries rather than a mere count of the number of "illiterate" people in the population. A detailed description of the data set is given in the OECD report (1997) and Murray *et al*. (1998).

The survey consists for most countries of a sample of 2000 to 3000 from the adult civilian population aged between 16 and 65.[3] The IALS is structured around three stages. First, each individual was required to complete a background questionnaire, which provided information on age, sex, education, labour market experiences and literacy related activities. An individual was deemed to be an IALS respondent if they partially or fully completed the background question-naire. Stage two involved the completion of six simple assignments; if the respondent answered incorrectly on more than two of these tasks the interview was terminated. This was in order to avoid assigning further tasks to those individuals of whom it is known that their literacy level is already very low

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2.   The countries involved were Australia; Canada; Belgium; Germany; Ireland; Netherlands; New Zealand; Sweden; Switzerland (French and German speaking); United Kingdom; United States and Poland. It is very similar to the larger National Adult Literacy Survey (or NALS) for the US conducted by the National Council for Educational Statistics (NCES) in 1992.

3.   Importantly given the topic of this survey all IALS countries were instructed to exclude residents in prisons, hospitals and psychiatric institutions. In the case of prisons this differs from the NALS data in the United States.

(known as Level 1).[4] Lastly a main booklet of tasks was given to each respondent, which resulted in a score that measured their literacy level. All assignments required the respondent to use materials from everyday life. For example, instructions from medicine bottles, the completion of order forms and reading a newspaper are listed amongst the tasks that were required in order to complete the test questionnaire.

The literacy level is measured on three scales: prose, document and quantitative. Prose literacy is the knowledge required to understand and use information from texts, such as newspapers, pamphlets and magazines. Document literacy is the knowledge and skill needed to use information from specific formats, for example from maps, timetables and payroll forms. Quantitative literacy is defined as the ability to use mathematical operations, such as in calculating a tip or compound interest. In order to provide an actual measure of literacy each individual was given a score for each task, which varied depending on the difficulty of the assignment. Scores for each scale range from 0-500, and are subsequently subdivided into five levels. Level 1 has a score range from 0-225 and would indicate very low levels where, for example, instructions for a medicine prescription would not be understood. The interval 226-275 defines Level 2 where individuals are limited to handling material that is not too complex and clearly defined. Level 3 ranges from 276-325 and is considered the minimum desirable threshold for most countries while Level 4 (326-375) and Level 5 (376-500) show increasingly higher skills which integrate several sources of information or solve complex problems.

III INTERPRETING LITERACY SCORES

It is clear from the study design that the definition of literacy was not intended to be focused on literacy and numeracy as conventionally thought of — rather it was aimed at encompassing a broad range of skills used in the context of working, schooling and home duties which are much more cognitive in nature than the term "literacy" at first suggests (OECD 1997). For example, one is asked to balance a chequebook, complete an order form, and maintain payroll data, which requires much more knowledge than the ability to read and write.

Kirsch and Mosenthal (1990) applied regression analysis to determine the difficulty of each task involved in the National Adult Literacy Survey (NALS) and to uncover what skills were being used in the completion of the tasks. Their findings suggest that the skills required to complete each task stretched beyond

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4. Seven per cent of the total IALS sample had their interviews terminated. However, they were not excluded from the sample but simply allocated to Level 1. The specific distributions are not available for Ireland.

conventional "reading and writing" abilities and that the straightforward ability to locate and read information did not on average influence the difficulty of the task. This suggests that the definition of literacy in the NALS required more skill and ability than the traditional definition. Overall, they conclude that an ordered set of skills and knowledge are called for in order to complete the different tasks. Given the IALS survey team adopted the NALS methodology and scaling procedures suggests that the various definitions of literacy in the IALS also require skills that are more cognitive in nature than the conventional understanding.[5]

IV COHORT ANALYSIS

For this paper we focus on the results from the IALS for the Republic of Ireland and we include Great Britain, and Northern Ireland as a means for comparison. Table 1 shows standard descriptive statistics for the sample used in this report based on men and women aged 16 to 65 with full information on a range of characteristics, most importantly the scores and educational information.[6]

Table 1: *Descriptive Statistics*

| | Republic of Ireland | | Great Britain | | Northern Ireland | |
	Mean	Std.Dev.	Mean	Std.Dev.	Mean	Std.Dev.
Age	37.9	13.5	40.0	13.2	38.5	12.9
Years of Schooling	10.5	2.9	12.5	2.8	12.7	2.8
Document Literacy	261.5	58.2	275.9	60.8	268.2	65.5
Quant Literacy	266.4	63.6	276.1	60.3	274.4	67.5
Prose Literacy	268.6	569.8	275.4	55.5	270.0	62.2
N	1,963		2,852		2,288	

The demographics appear very similar in terms of the age structure of the population for the RoI and NI, but the British population is on average 1.5 years older. There are some stark differences between the samples with respect to education levels. The NI and GB sample has an average schooling level some 2/2.2 years higher than the RoI. This is almost certainly a reflection of the differences in the secondary school system that prevailed until the late 1960s,

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5.   This is not to disregard other types of skills (such as teamwork or communication skills) that are important, but in practice these are impossible to measure.
6.   We excluded those that did not give their age and given that the schooling measure was central to our analysis we also excluded those that did not give their schooling history.

specifically that NI followed the rest of Great Britain in having an established, non-fee secondary school system where the school leaving age was set at 15 (and later increased to 16). The system in the RoI was fee-paying and the minimum school leaving age was 14 which would account for the difference in means for the schooling variable. Also, average scores on the various tests are slightly higher in GB/NI as compared to RoI.
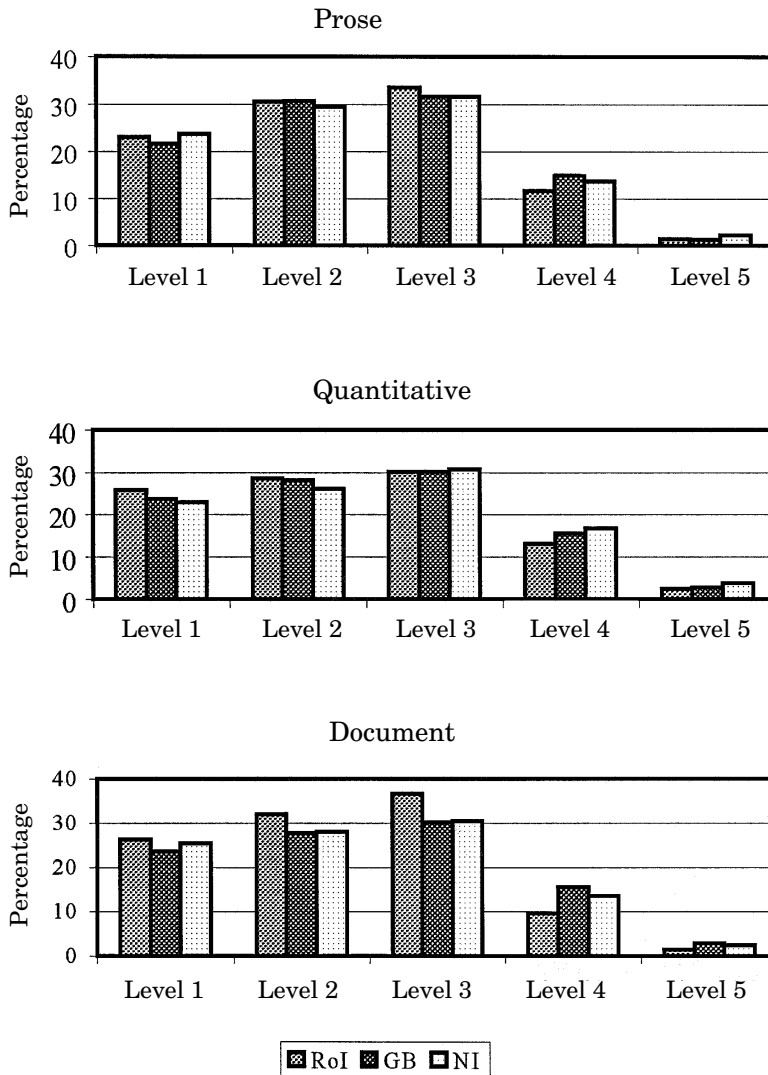
Figure 1: *Distribution of Prose, Quantitative and Document Literacy across Five Levels*

Figure 1 shows the distribution of Prose, Quantitative and Document Literacy across the five levels. The RoI has a highest percentage at levels 1 and 2 and less people in Levels 4 and 5 than GB or NI. This is particularly pronounced for Document Literacy. OECD (1997) shows that the RoI has the second highest percentage at the lower levels of literacy (after Poland) and the second lowest percentage at levels 4 and 5 in the IALS. This is particularly worrying when we consider that more that 50 per cent of the sample for the RoI is below Level 3, the minimum desirable threshold for most countries. Those individuals below Level 3 according to the OECD (1998) will have "difficulties in coping with social and economic life in a modern democratic society".

Figure 2 shows the percentage at each educational level for the RoI, GB and NI. The first graph shows the highest education level achieved for each country for the whole sample. We find that almost 22 per cent of the sample have primary education as their highest qualification, compared to less than 10 per cent for GB and NI and almost 50 per cent of the sample have completed lower secondary education in GB and NI compared to 30 per cent for the RoI.

The following two graphs split the sample into two age cohorts for those born before and after 1954 respectively. We find that 40 per cent of the older cohort have primary education as their highest level of education attained, with GB and NI having a significantly lower number in this category. The RoI also has lower numbers reaching the first stage of secondary education. Looking at the younger cohort we find higher numbers having completed secondary education in the RoI. The difference between the two age groups and the reason for splitting the sample at this age is that the older cohort were obliged to pay fees to attend secondary education, which acted as a barrier for participation in secondary education. However, a policy change in 1966 introduced free secondary education, consequently removing this barrier, resulting in higher participation rates in secondary schools, as reflected in the sample for the younger age cohort.

When we compare the two cohorts we find that the Republic of Ireland's poor relative performance may arise because of the lower scores of the older group associated with lower actual education levels in this cohort. To investigate this we look at a younger cohort of 16-25 year olds across the three countries in Figure 3. We then find that there are fewer numbers in Level 1 on each scale and more individuals reaching Levels 3 and 4. Hence, looking at the sample as a whole does not represent the gains made by the younger population in improving their literacy.

V EDUCATION AND LITERACY

In this section we investigate the relationship between education and literacy by estimating a reduced form regression with the continuous literacy variables
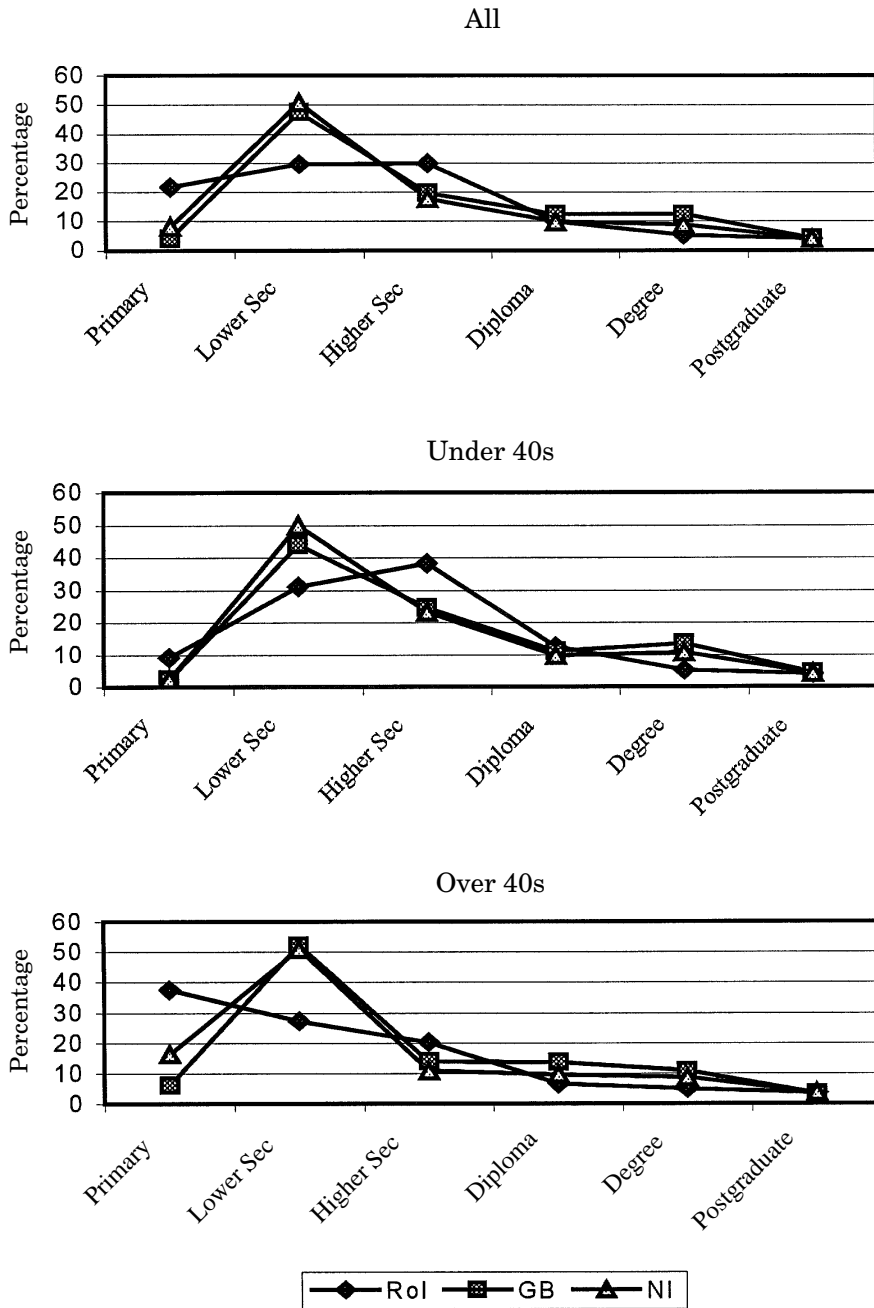
All

Under 40s

Over 40s

Figure 2: *Distribution of Education Levels by Age Cohort*

Prose

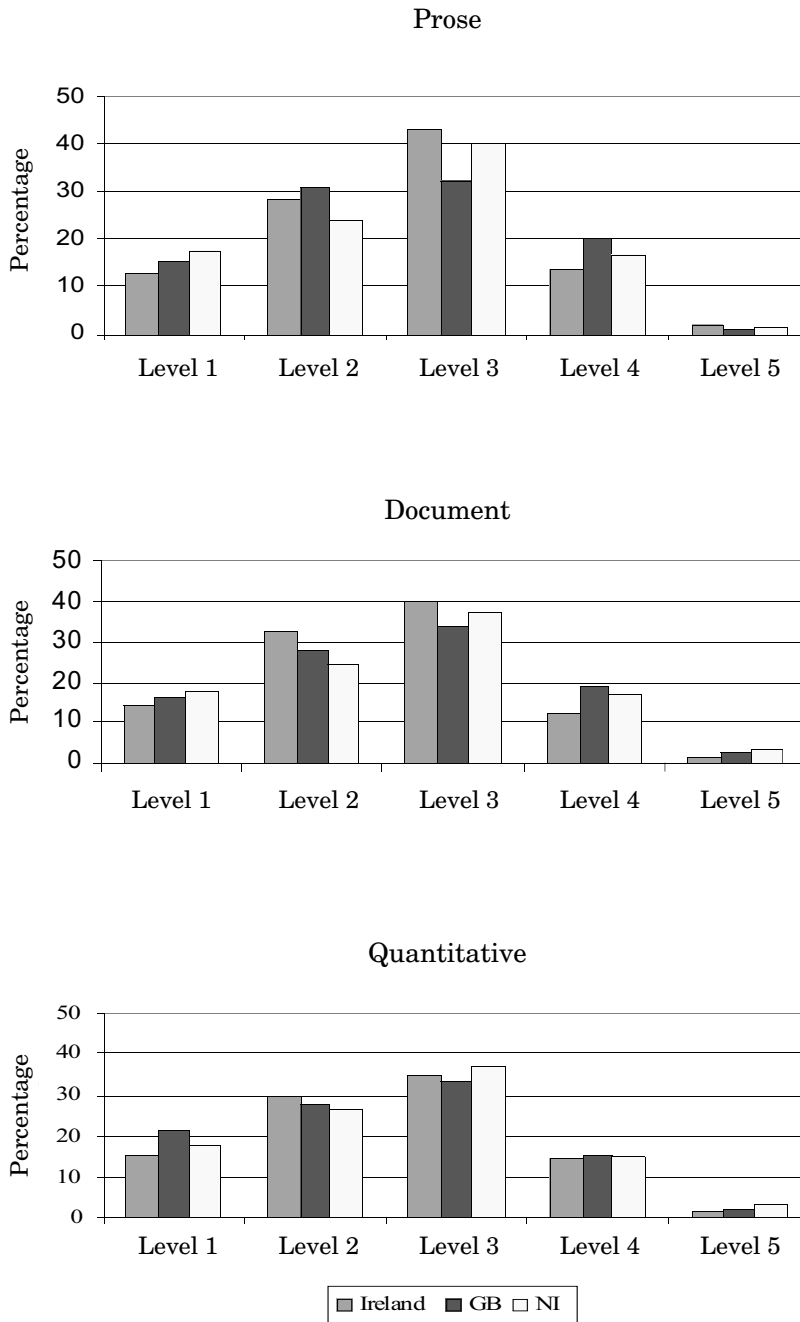## Document

Quantitative

Figure 3: *Distribution of Literacy Scores for 16-26 year olds*

(prose, document, quantitative) as the dependent variables and education as the independent variable. The education measure is split into six levels based on the international classification ISCED, which is comparable across the three countries. Our regression results are reported in the Appendix to this paper.

From our regression results the Republic of Ireland is more effective in converting the respondent's education into literacy proficiency at all levels of education as each education level returns higher scores than the other two countries. In Table 2 we construct indices based on the estimated marginal effects of education on the three literacy scores. Using the RoI as the comparison country (implicitly carrying a value of 1 for each literacy scale) we find the RoI is indeed more effective at all levels of education at each scale. For example, lower secondary education in GB is only worth about three-quarters (0.76) of the equivalent level in the RoI in terms of its marginal impact on prose scores. In Northern Ireland lower secondary education is valued at about 56 per cent of that of the RoI on the Document scale.[7]

Table 2: *Index of Impact of Respondent's Education on Literacy Scores*

| | GREAT BRITAIN | | | NORTHERN IRELAND | | |
	Prose	*Document*	*Quantitative*	*Prose*	*Document*	*Quantitative*
Lower Secondary	0.76	0.77	0.75	0.71	0.56	0.67
Higher Secondary	0.82	0.92	0.93	0.79	0.85	0.88
Diploma/Certificate	0.95	0.99	0.96	0.96	0.99	0.97
Degree	0.93	0.94	0.99	0.94	0.84	0.89
Postgraduate	0.88	0.96	0.94	0.92	0.90	0.92

VI CONCLUSION

An analysis of the International Adult Literacy Survey brings some important findings. We find that education plays a dominant role in determining literacy levels. In contrast to the quite negative portrayal of Ireland in recent OECD and World Development Study reports we show that the RoI is more effective in converting periods of formal schooling into changes in the literacy skill of individuals, as compared to Great Britain and Northern Ireland. One might

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7. This pattern persists as we continue up the education system, but with the difference becoming less and less pronounced. Clearly higher levels of education may be more homogenous between countries. Moreover there will be less variation in ability at higher levels of education given that the respondent will have passed through the examination system in order to reach tertiary education.

therefore consider policy instruments that encourage those most at risk from the trap of low educational attainment to participate in education to be the most effective in combating the problem of low literacy.

We also find that the relative low literacy level of the Irish population is largely attributable to a cohort effect. Prior to 1966 individuals were obliged to pay fees to attend secondary school. This acted as a barrier to participation for many at secondary level. Consequently, the older age cohort has a lower level of educational attainment, which is reflected in a lower level of literacy proficiency. However, the participation rates in education have increased dramatically since the 1970s, which produces a more favourable distribution of literacy scores in Ireland. In fact looking at the 16-25 age cohort we find that there are fewer individuals in Level 1 in Ireland on each scale and more individuals reaching Levels 3 and 4.

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APPENDIX

Table A: *Impact of Characteristics on Literacy Attainment-Prose*

	RoI		NI		GB	
	Coeff	Std. Err	Coeff	Std. Err	Coeff	Std. Err
Age	−0.25	0.09	−0.45*	0.098	−0.39*	0.07
Lower Secondary	42.45*	3.16	30.30*	4.41	32.51*	4.68
Higher Secondary	68.96*	3.33	54.56*	5.15	56.42*	4.98
Diploma	77.48*	4.43	74.71*	5.58	73.98*	5.18
Degree	94.45*	5.56	88.90*	5.63	88.01*	5.24
Postgraduate	97.00*	6.27	89.60*	7.23	85.22*	6.45
Father-Lower Secondary	−0.59	3.40	-0.72	4.03	18.36*	4.05
Father-Higher Secondary	7.52	4.24	11.33	6.46	22.00*	5.79

Table A: *Impact of Characteristics on Literacy Attainment-Prose (cont'd)*

	RoI		NI		GB	
	Coeff	*Std. Err*	*Coeff*	*Std. Err*	*Coeff*	*Std. Err*
Father-Diploma	14.94	8.47	13.88	8.20	26.10*	6.27
Father-Degree	9.35	7.42	1.15*	7.36	23.39*	6.12
Father-Postgraduate	22.00*	10.28	−0.32	12.62	25.63*	8.81
Mother-Lower Secondary	−2.64	3.22	6.01	4.10	-2.36	4.10
Mother-Higher Secondary	2.99	4.00	24.45*	6.38	8.52	5.83
Mother-Diploma	−10.77	7.65	17.16*	6.85	11.41	6.25
Mother-Degree	1.35	11.40	10.89	9.16	17.46*	7.27
Mother-Postgraduate	−2.49	12.78	−48.64*	23.51	24.37	14.61
Constant	227.34*	4.74	236.79	6.79	223.90*	6.66
R^2	0.337		0.235		0.256	
N	1,921		2,288		2,852	

* $p < 0.05$.

Table B: *Impact of Characteristics on Literacy Attainment-Document*

	RoI		NI		GB	
	Coeff	*Std. Err*	*Coeff*	*Std. Err*	*Coeff*	*Std. Err*
Age	−0.29	0.09	−0.56*	0.10	−0.47*	0.08
Lower Secondary	40.12*	3.25	22.80*	4.78	30.94*	5.18
Higher Secondary	63.86*	3.43	54.72*	5.45	58.87*	5.52
Diploma	73.28*	4.56	71.65*	5.91	72.83*	5.74
Degree	96.71*	5.72	80.77*	5.97	91.51*	5.81
Postgraduate	92.14*	6.45	83.67*	7.66	89.19*	7.15
Father-Lower Secondary	2.42	3.50	−1.63	4.27	14.99*	4.48
Father-Higher Secondary	9.34*	4.36	8.91	6.84	28.20*	6.41
Father-Diploma	21.88*	8.72	16.49	8.70	22.42*	6.95
Father-Degree	10.55	7.64	14.23	7.80	24.28*	6.78
Father-Postgraduate	16.00	10.58	11.81	13.37	20.51*	9.76
Mother-Lower Secondary	1.34	3.31	5.53	4.34	2.21	4.54
Mother-Higher Secondary	8.67*	4.12	17.72*	6.76	11.98	6.46
Mother-Diploma	−15.31*	7.88	27.26*	7.25	13.01	6.92
Mother-Degree	15.41	11.73	12.98	9.69	11.30	8.05
Mother-Postgraduate	6.09	13.15	−12.16	24.90	20.74	16.18
Constant	222.16*	4.87	244.72*	7.19	226.13*	7.37
R^2	0.332		0.225		0.240	
N	1,921		2,288		2,852	

* $p < 0.05$.

Table C: *Impact of Characteristics on Literacy Attainment-Quantitative*

	RoI		NI		GB	
	Coeff	*Std. Err*	*Coeff*	*Std. Err*	*Coeff*	*Std. Err*
Age	−0.13	0.10	−0.78	0.11	−0.09	0.08
Lower Secondary	43.75*	3.67	29.28*	5.00	32.71*	5.13
Higher Secondary	68.45*	3.87	60.55*	5.70	63.71*	5.46
Diploma	78.28*	5.14	77.62*	6.19	75.35*	5.68
Degree	102.04*	6.45	91.21*	6.24	101.53*	5.74
Postgraduate	100.58*	7.27	92.25*	8.01	94.88*	7.07
Father-Lower Secondary	1.85	3.95	1.75	4.46	12.28*	4.44
Father-Higher Secondary	9.03	4.91	11.72	7.15	23.28*	6.34
Father-Diploma	17.83	9.84	21.54*	9.09	19.50*	6.88
Father-Degree	3.78	8.62	13.50	8.16	18.88*	6.71
Father-Postgraduate	30.71*	11.93	7.68	13.98	12.26	9.65
Mother-Lower Secondary	−2.10	3.73	4.95	4.54	−1.53	4.49
Mother-Higher Secondary	6.47	4.65	18.38*	7.07	3.34	6.39
Mother-Diploma	−10.83	8.89	15.92*	7.59	3.88	6.84
Mother-Degree	25.86	13.24	13.46	10.14	13.12	7.96
Mother-Postgraduate	9.21	14.83	14.75	26.05	15.40	16.01
Constant	218.40*	5.50	224.94*	7.52	214.06*	7.30
R^2	0.290		0.201		0.243	
N	1,921		2,288		2,852	

* $p < 0.05$.